Center Independent Research & Development: GSFC IRAD

Chemical Mechanical Planarization Technology Enabling for Astrophysics Missions

Completed Technology Project (2017 - 2018)

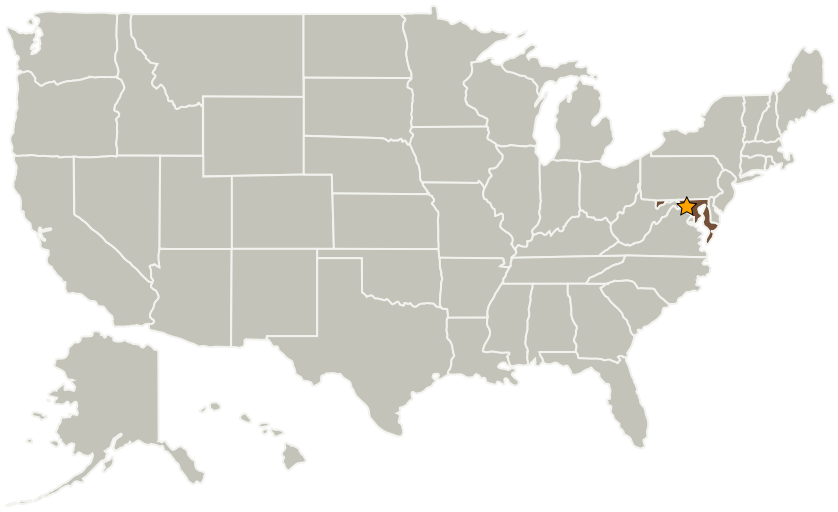
Project Introduction

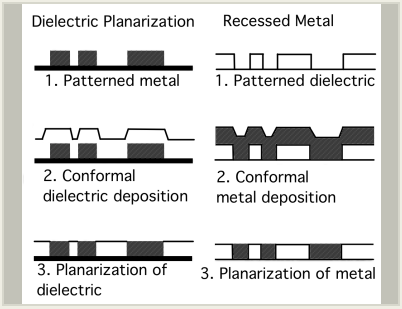
Detector technology for NASA applications is progressing to more complex multilayer circuits to gain advances in array size or detector performance. Chemical Mechanical Planarization (CMP) is a technique that maintains high fabrication yield and increases feature density in multilayer structures. While outside foundries offer CMP for a limited set of materials, we propose to leverage in-house and federal government facilities to develop custom CMP techniques for the specific materials we need, thereby enabling breakthrough enhancements in detectors, multiplexers, and microwave devices for astrophysics missions.

Anticipated Benefits

Chemical Mechanical Planarization technology enabling higher performance detectors, multiplexers, and microwave devices for astrophysics missions.

Primary U.S. Work Locations and Key Partners





CMP planarization processes for dielectrics and metals.

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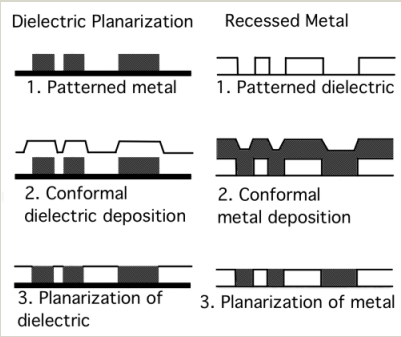
Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Department of Commerce(DoC)	Supporting Organization	US Government	Washington, District of Columbia

Primary U.S. Work Locations
Maryland

Images



CMP planarization processes
CMP planarization processes for dielectrics and metals.
(https://techport.nasa.gov/image/28230)

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

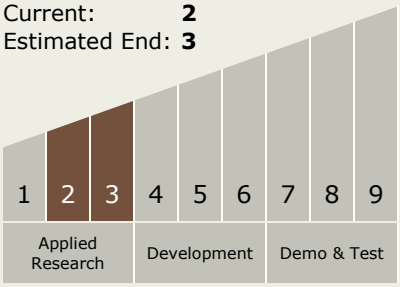
Program Manager:
Peter M Hughes

Project Managers:
Megan E Eckart
Timothy D Beach

Principal Investigator:
Thomas R Stevenson

Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **3**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

Outside the Solar System, Foundational Knowledge